

Name: _____

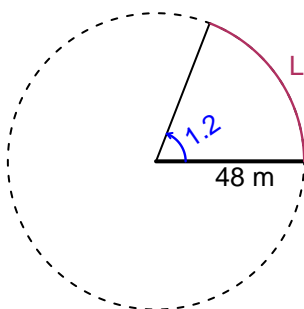
Date: _____

Trig Final (TEST v690)

- You can use a calculator (like [Desmos](#))
- You should have a unit-circle with special angles and coordinates marked.

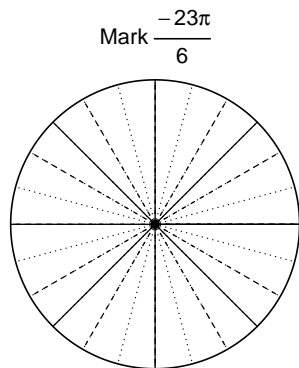
Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The radius is 48 meters. The angle measure is 1.2 radians. How long is the arc in meters?

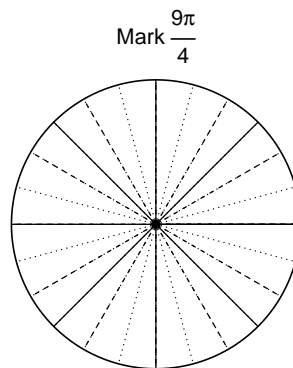


Question 2

Consider angles $-\frac{23\pi}{6}$ and $\frac{9\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\sin\left(-\frac{23\pi}{6}\right)$ and $\cos\left(\frac{9\pi}{4}\right)$ by using a unit circle (provided separately).



Find $\sin(-23\pi/6)$



Find $\cos(9\pi/4)$

Question 3

If $\tan(\theta) = \frac{-72}{65}$, and θ is in quadrant II, determine an exact value for $\sin(\theta)$.

Question 4

A mass-spring system oscillates vertically with an amplitude of 7.31 meters, a frequency of 6.06 Hz, and a midline at $y = 2.55$ meters. At $t = 0$, the mass is at the midline and moving up. Write an equation to model the height (y in meters) as a function of time (t in seconds).